environmental affairs
Department:
Environmental Affairs
REPUBLIC OF SOUTH AFRICA

RISK ASSESSMENT IN TERMS OF REGULATION 8 OF THE WASTE EXCLUSION REGULATIONS

APPLICANT	Glencore Operation South Africa Pty Ltd: Rustenburg Smelter
WASTE STREAM OR PORTION OF A WASTE STREAM	Waste Slag from Ferrochrome Metallurgy
BENEFICIAL USE/S	Use as aggregates
	Concrete aggregates
	Road base and covering and road stabilisation
	Asphaltic concrete and other bituminous mixtures
	Construction fill
	Concrete products

	Plaster and granite sands
	Railroad ballast
	Roofing granules
	Filtration media
	Pipe filling material
	Backfilling
	Dam construction and stabilisation material
	Construction of drainage systems
	Hydroponic filling material
	Production of cement
WASTE GENERATING FACILITY	
PHYSICAL ADDRESS OF FACILITY	44 Vanadium Street
	Rustenburg, 0299
GPS CO-ORDINATES OF WASTE GENERATING FACILITY	Latitude: 25 37 20.0S Longitude: 27 13 07.8E

CONTACT PERSON	
NAME	Tommie Hurter
ADDRESS	Portion 27, JQ305, Waterval, Rustenburg, North West, 0300
EMAIL ADDRESS	Tommie.hurter@glencore.co.za
TELEPHONE	014 590 2415
* DETAILED DESCRIPTION OF WASTE GENERATING PROCESS	Ferrochrome is an essential ingredient for the production of stainless steel, and is an alloy of iron and chromium with a chromium content of between 50 and 55 percent. Stainless steel depends on chrome for its appearance and its resistance to corrosion. Ferrochrome production is essentially a carbothermic reduction operation taking place at high temperatures. The ore – an oxide of chromium and iron – is reduced by coal and coke to form an iron-chromium alloy called ferrochrome. The heat for this reaction comes from the electric arc formed between the tips of the electrodes in the bottom of the furnace and the furnace hearth. This arc creates temperatures of about 2 800°C Tapping takes place intermittently. When enough smelted ferrochrome has accumulated in the hearth of the furnace, the tap hole is drilled open and a stream of molten metal and slag flows down a trough into a chill or ladle. The ferrochrome solidifies in large castings, while the slag is separated and stockpiled for further processing. The product is crushed and screened to exact customer specifications. Alternatively, the ferrochrome is granulated into a flowing stream of water. To improve total ferrochrome recovery while maintaining a high-quality product, alloy recovery plants are utilised to recover the ferrochrome from the slag produced during the charge chrome process. The slag, which has a metallic content of approximately 4 percent, is processed through a series of crushers and broken down to minus 15mm material. It then moves through a wet jigging plant where the chrome and slag are separated by means of gravity or magnets. The slag is then stockpiled into various size fractions for further use by external customers. Un-used slag is then disposed of a slag waste storage facility. The slag from these facilities is intended to be recovered for beneficial uses as listed above.

PRODUCTION PROCESS FLOW CHART ATTACHED	YES ✓	NO
IDENTIFICATION OF HAZARDS	Not applicable	
WASTE CLASSIFICATION	HAZARDOUS	GENERAL
		X
*A process flow chart must be attached to the process description		

RISK ASSESSMENT WITHOUT MITIGATION

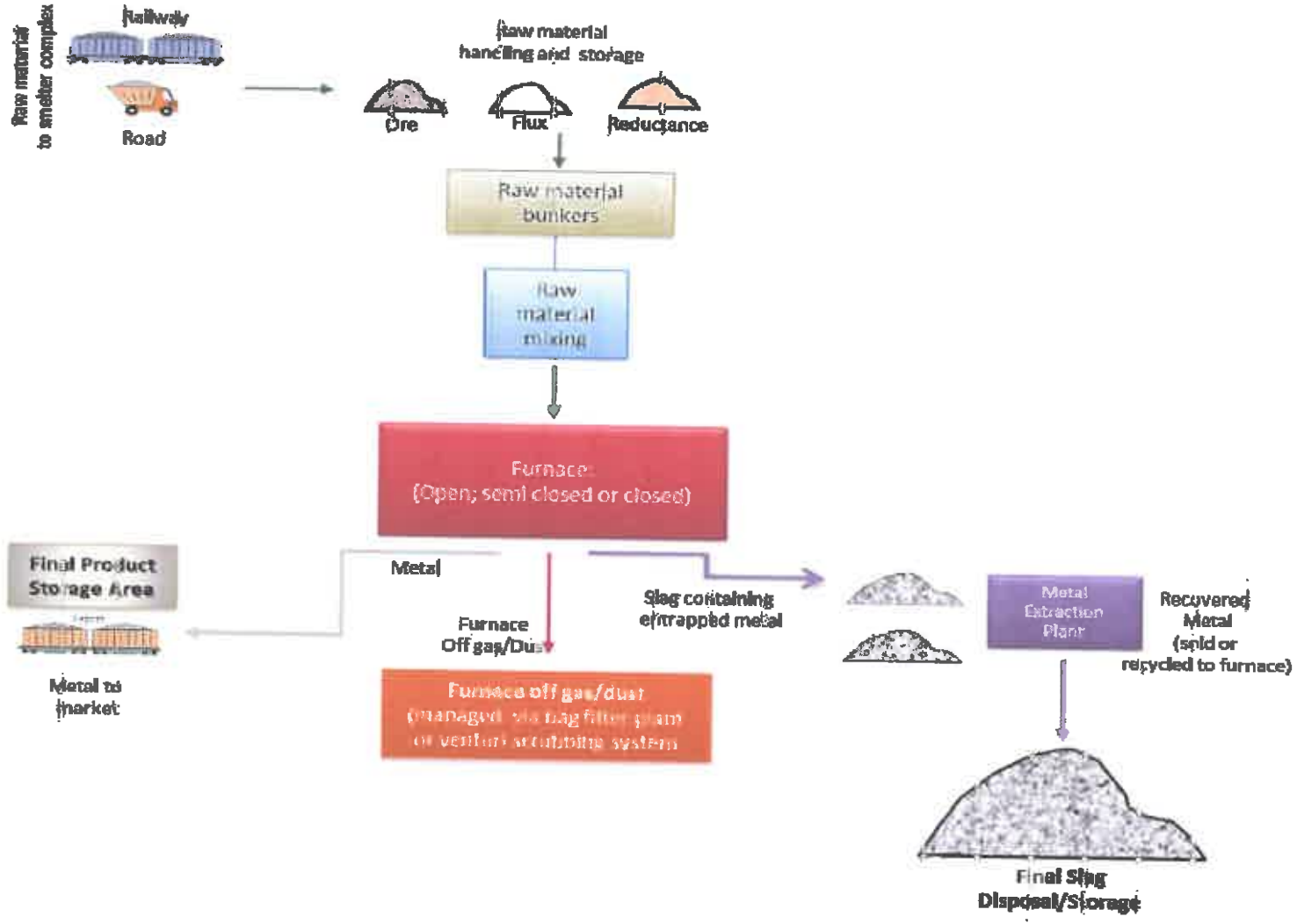
Activity	Risk Description	Environmental receptors	Impact	Assessment of the risk				
				Probability	Magnitude	Duration	Scale	Significance
Transporting of slag	Potential for slag to become air-borne during transportation	Surrounding environment - Air - Roads - Other road users	Deterioration of air quality Damage to other vehicles	2	2	1	3	12 - low

Activity	Risk Description	Environmental receptors	Impact	Assessment of the risk				
				Probability	Magnitude	Duration	Scale	Significance
Handling of slag	Potential for slag to emit dust during the loading and offloading of the slag	Air	Deterioration of local air quality	2	2	1	1	8 - low
Material storage	Potential for stockpiled material to enter the surrounding environment	Soil (primary) Surface water (secondary)	Slag spillage on soil Slag spillage in water causing siltation	3	2	1	1	12 - low
Material handling and processing	Potential for slag to emit dust during handling, crushing and screening activities	Air	Deterioration of air quality	2	4	2	1	14 - low

Activity	Risk Description	Environmental receptors	Impact	Assessment of the risk				
				Probability	Magnitude	Duration	Scale	Significance
Material handling and processing of slag	Potential for skin exposure of humans whilst working with slag	Health - skin	Potential for skin irritation and abrasion	4	2	1	1	16– low
Material handling and processing of slag	Potential for eye contact exposure of humans whilst working with slag	Health - eye	Potential for eye irritation and abrasion	4	2	1	1	16– low
Material handling and processing of slag	Potential for inhalation of dust exposure of humans	Health - respiratory system	Potential for respiratory irritation	4	2	1	1	16– low

Activity	Risk Description	Environmental receptors	Impact	Assessment of the risk				
				Probability	Magnitude	Duration	Scale	Significance
	whilst working with slag							
Material handling and processing of slag	Potential for ingestion of slag dust by humans whilst working with slag	Health	Potential for irritation	2	2	1	1	8 – low
Environmental spillage	Potential for accidental release of slag into the environment during transport and material handling	Soil, surface water.	Minor localised silt contamination Visual impacts	1	2	1	1	4 – low

Process Flow Diagram



The following factors and criteria must be used to assess the impacts of the activities:

Criteria	
MAGNITUDE (Severity)	DURATION
10 - Very high	5 – Permanent (longer than 10 years)
8 – High	4 - Long-term (5 to 10 years)
6 – Moderate	3 - Medium-term (12 months to 5 years)
4 – Low	2 - Short-term (0 to 12 months)
2 – Minor	1 – Immediate
SCALE	PROBABILITY (Likelihood)
5 – International	5 - Definite
4 – National	4 - Highly probable
3 – Regional	3 - Medium probability
2 – Local	2 - Low probability
1 - Site only	1 – Improbable
0 – None	0 – None

Magnitude
Magnitude measures the size of the impact

Duration
Duration refers to the lifetime of the impact i.e. how long it will last

Scale
The scale refers to the extent of the impact.

Probability
The probability refers to the chance of impact to occur. The potential impact could be most likely to occur unlikely, etc

Assessment of Significance of impact

Significance rating of the potential impacts illustrates the importance of the impact itself. The size of area affected by pollution may be extremely high but the significance of this effect is dependent on the concentration or level of pollution in that area. In order to determine the significance of impact, the following method was used:

Significance Points (SP) = (Magnitude + Duration + Scale) * Probability

The values of SP are then ranged as follows:

	Rating	Description
SP >60	Indicates high environmental significance	An impact which could influence the decision about whether or not to proceed with the activity regardless of any possible mitigation.
SP 30 – 60	Indicates moderate environmental significance	An impact or benefit which is sufficiently important to require management and which could have an influence on the decision unless it is mitigated.
SP <30	Indicates low environmental significance	Impacts with little real effect and which will not have an influence on or require modification of the activities.
+	Positive impact	An impact that is likely to result in positive consequences/effects

I TF Hurter hereby declare that I have read the completed the Risk Assessment form and hereby confirm that the information is to the best of my knowledge true and correct.

Furthermore, I declare that I am fully aware of my responsibilities in terms of the Waste Exclusion Regulations, and that failure to comply with these Regulations may constitute an offence in terms of the National Environmental Management: Waste Act, 2008 (Act 59 of 2008).

Applicant (Full names) Thomas Francois Hurter

Designation Group Environmental Manager

Signature

Date 24/8/2018 Place Rustenburg

FOR OFFICE USE ONLY

Date Received					
Decision Taken	Authorised		Not Authorised(provide reasons)		
Reference Number					